

Lunar Roadmap Alternatives & Key Questions

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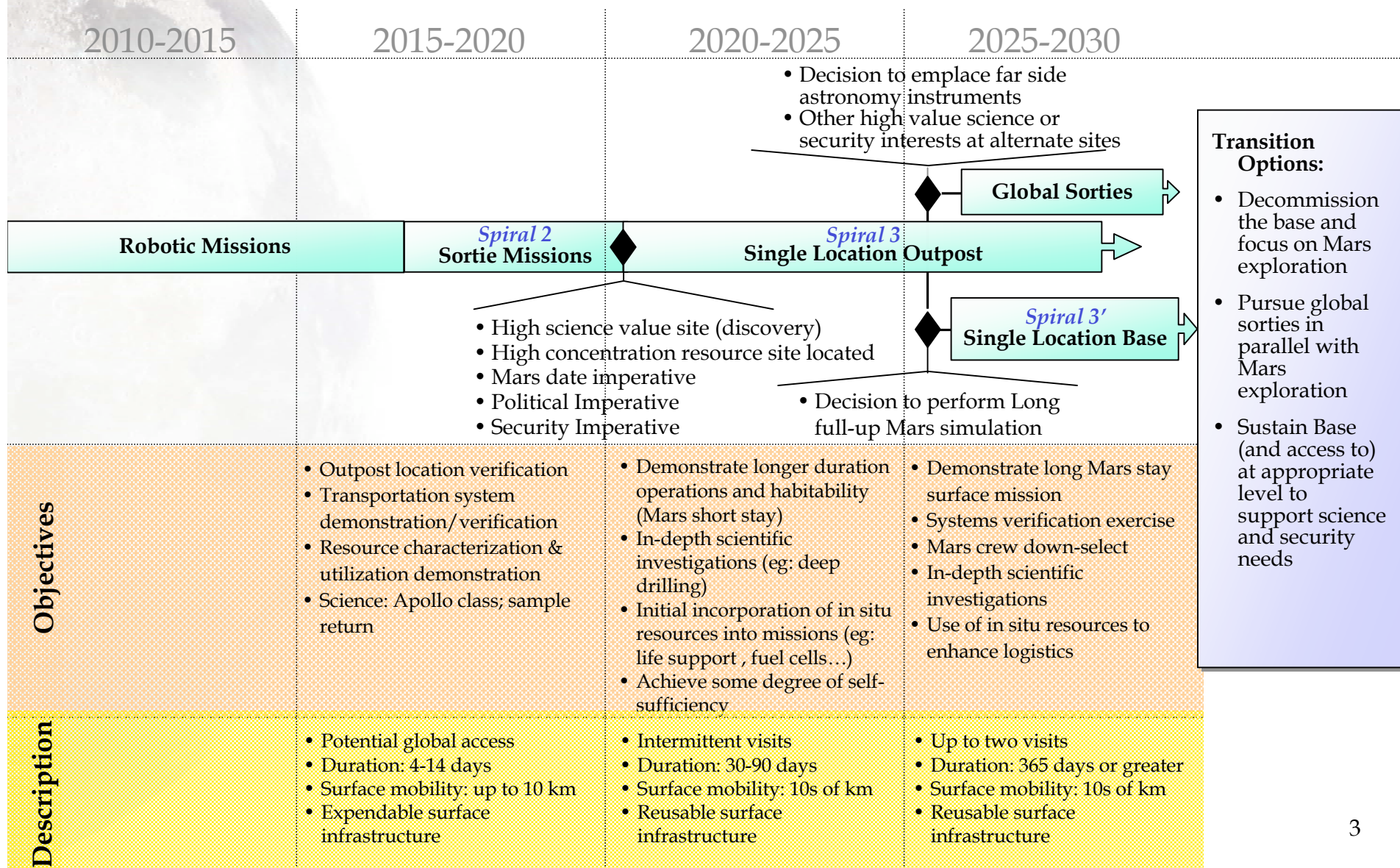
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Lunar Roadmap Alternatives

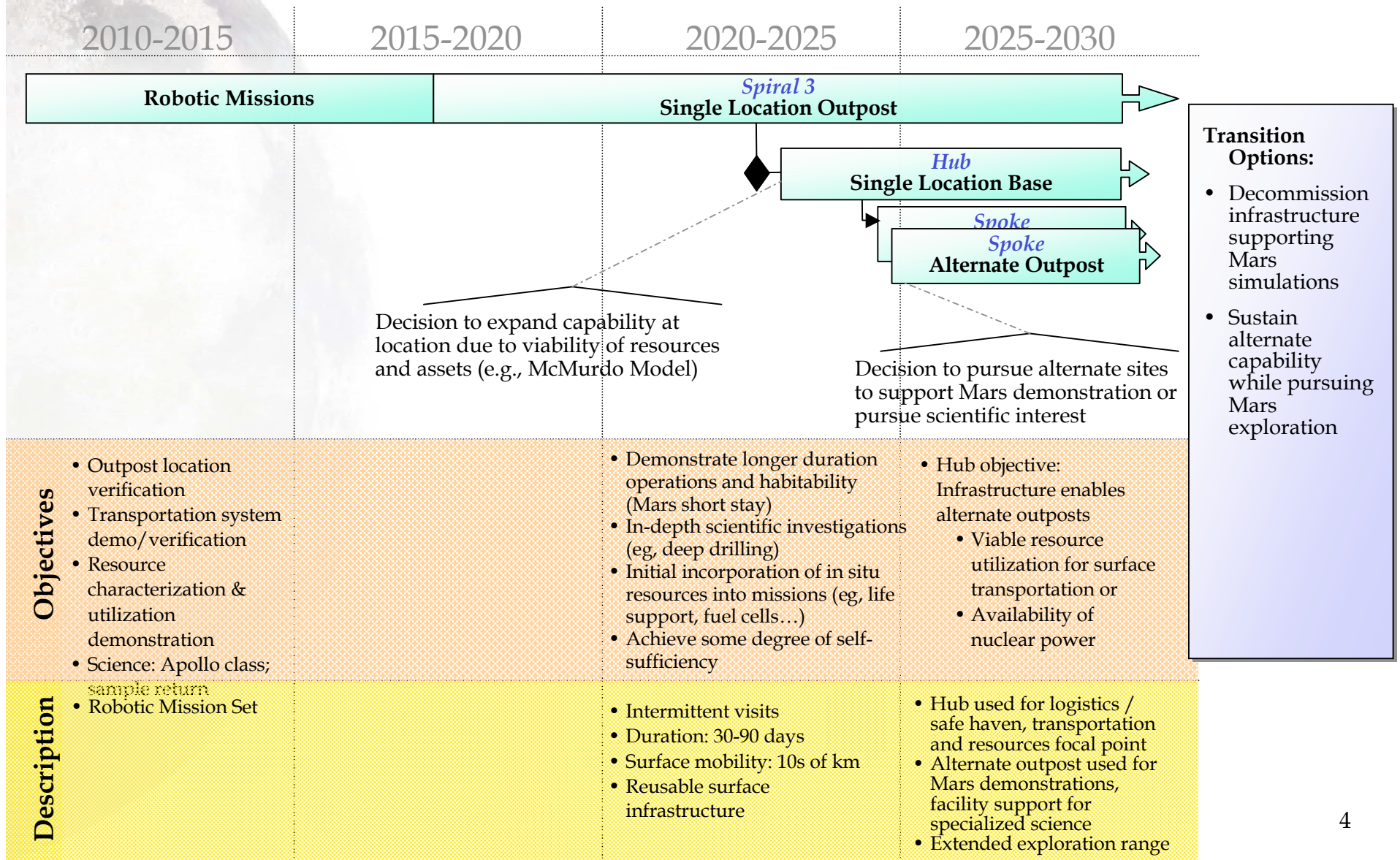


- **Presenting 4 roadmap alternatives for committee to consider**
 - Evolution Emphasis
 - Early Outpost
 - Expedited Moon-to-Mars
 - Commercial Emphasis
- **Exercise for committee**
 - Review and edit presented set of roadmap alternatives
 - Eliminate from *or* add to set of roadmap alternatives

Option A: Evolution Emphasis



Option B: Early Outpost



Option C: Expedited Moon-to-Mars



2010-2015

2015-2020

2020-2025

2025-2030



Extensive Terrestrial Analog
Long Duration Mars Simulations

Revolutionary Mars discovery
accelerates decision to send
humans to Mars

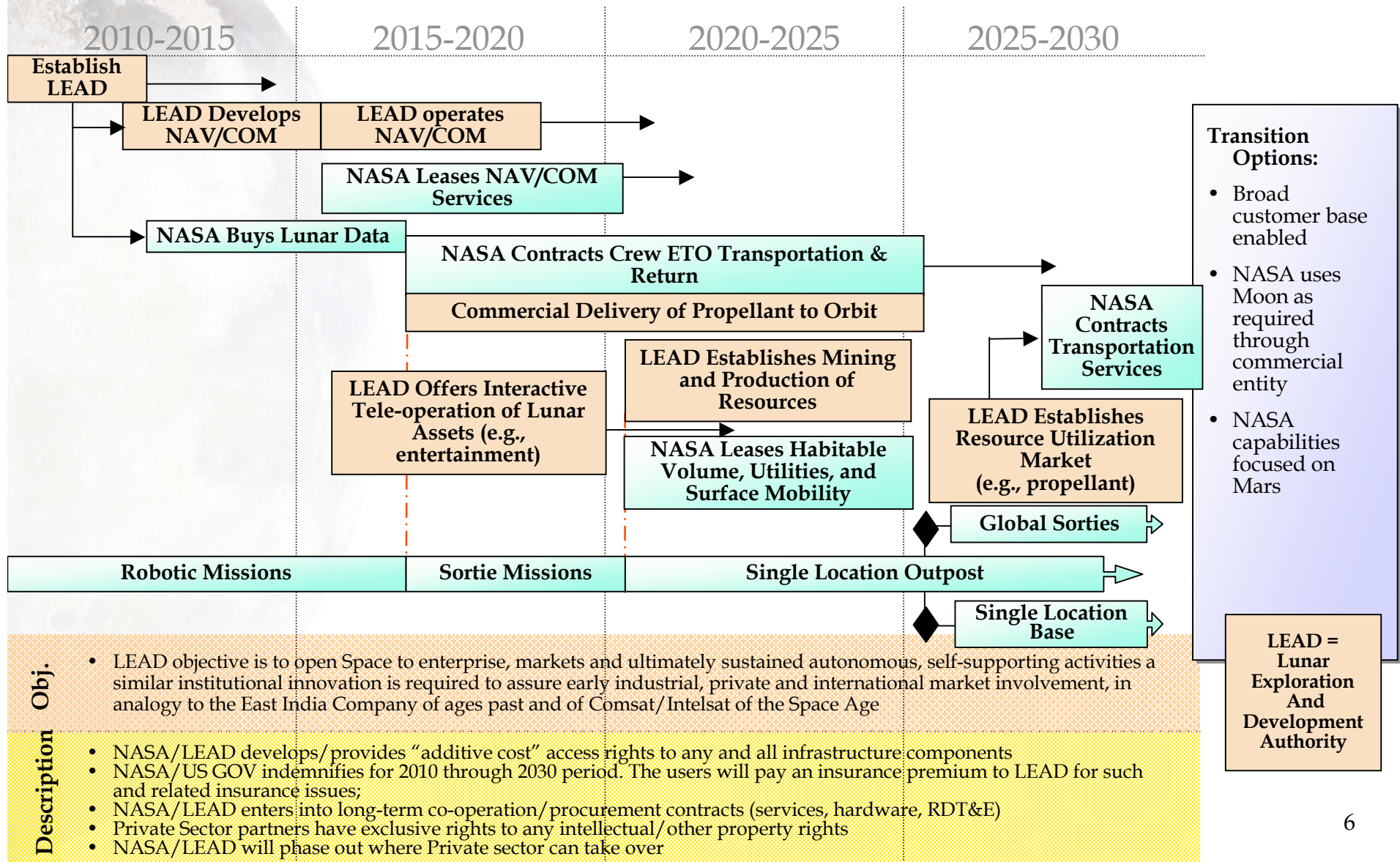
Objectives

- Demonstrate operational readiness beyond LEO capabilities (ie: Gemini of Apollo)
- Opportunistic Lunar Science
- Extensive system test and crew experience performed at terrestrial analog (in the interest of time and funding)
- Abandon human lunar presence
- Abandon program elements not applicable to Mars
- NASA capability transitions to Mars Exploration

Description

- Less than 5 missions
- Duration: 4-14 days
- Location independent
- Expendable Infrastructure
- Transition from Lunar to Mars only human missions

Option D: Commercial Emphasis



Key Questions



Transition Strategy

- How should NASA transition from a lunar focus to a Mars focus once lunar objectives are achieved?
- How do we build in a transition strategy from the beginning, particularly for commercial interests?

“Sustained”

- What is the definition of “Sustained” exploration as applied to the Moon (e.g., Moon to stay or Moon as a stepping stone)?
- Is “Sustained” an objective for returning to the Moon or a Figure of Merit?

Other

- How long a stay on the lunar surface is required to demonstrate Mars adaptation and operations (assumes long duration on Mars)?
- How should terrestrial analogs be used in conjunction with lunar activities?
- What is the best approach for international collaboration?